

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 April 2002 (11.04.2002)

PCT

(10) International Publication Number
WO 02/28560 A3

(51) International Patent Classification⁷: **E21B 33/12**,
F16L 33/16

(21) International Application Number: PCT/US01/31211

(22) International Filing Date: 3 October 2001 (03.10.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/684,412 6 October 2000 (06.10.2000) US

(71) Applicant: **OBJ CORPORATION** [US/US]; 3201 Cherry
Ridge Dr., Suite C319, San Antonio, TX 78230 (US).

(72) Inventors: **BAILEY, Gary, L.**; 14826 Willow Bend, San
Antonio, TX 78232 (US). **WOODS, Ross, S.**; 4959 Shady
Oak Trail, Grand Prairie, TX 75052 (US).

(74) Agents: **KAMMER, Mark, A.** et al.; Cox & Smith Incor-
porated, 112 East Pecan Street, Suite 1800, San Antonio,
TX 78205 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI,
SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA,
ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,
CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD,
TG).

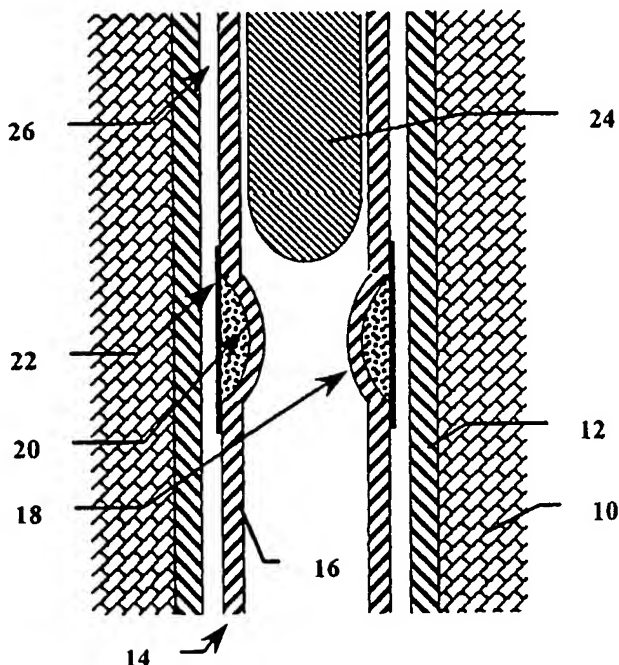
Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
13 June 2002

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR EXPANSION SEALING CONCENTRIC TUBULAR STRUCTURES



(57) Abstract: An apparatus and method for the seal-
ing of a first tubular member (16) in a fixed position
with respect to a second concentric tubular member
(12). The inner tubular member (16) is formed with
a shallow annular depression (18) in the tube wall
at the point of sealant placement, which causes the wall
of the inner tubular member to intrude into the other-
wise cylindrical passage within the tube. On the outer
surface of the first tubular member the depression is
filled with a partially compressible fluid (20). The an-
nular depression and the partially compressible fluid
are then covered over by a malleable/ductile sleeve
(22). Activation of the seal involves directing a cylin-
drical displacement device (24) through the inside of
the inner tubular member and past the annular intru-
sion such that the wall is straightened. The partially
compressible fluid and cover are forced outward into
sealing engagement with the outer tubular member.

WO 02/28560 A3



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/31211

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : E21B 33/12; F16L 33/16 US CL : 277/314, 316, 333, 645; 166/187 According to International Patent Classification (IPC) or to both national classification and IPC														
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 277/314, 316, 333, 645, 332-4, 626, 627, 646; 166/187 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) East: tubes; pipes, compressible fluid, inflatable														
C. DOCUMENTS CONSIDERED TO BE RELEVANT														
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.												
X	US 5,048,605 A (TOON et al.) 17 September 1991 (17-09-1991), see entire document.	10												
A	US 6,102,407 A (MORIYA et al) 15 August 2000 (15-08-2000), see entire document.	1-20												
A	US 6,041,858 A (ARIZMENDI) 28 March 2000 (28-03-2000), see entire document.	1-20												
A	US 4,651,818 A (JOHNSON et al.) 24 March 1987 (24-03-1987), see entire document.	1-20												
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.														
<table border="0"><tr><td>* Special categories of cited documents:</td><td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td></tr><tr><td>"A" document defining the general state of the art which is not considered to be of particular relevance</td><td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td></tr><tr><td>"E" earlier document published on or after the international filing date</td><td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td></tr><tr><td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td><td>"A" document member of the same patent family</td></tr><tr><td>"O" document referring to an oral disclosure, use, exhibition or other means</td><td></td></tr><tr><td>"P" document published prior to the international filing date but later than the priority date claimed</td><td></td></tr></table>			* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"A" document member of the same patent family	"O" document referring to an oral disclosure, use, exhibition or other means		"P" document published prior to the international filing date but later than the priority date claimed	
* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention													
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone													
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art													
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"A" document member of the same patent family													
"O" document referring to an oral disclosure, use, exhibition or other means														
"P" document published prior to the international filing date but later than the priority date claimed														
Date of the actual completion of the international search 05 MARCH 2002		Date of mailing of the international search report 11 APR 2002												
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230		Authorized officer ALISON PICKARD Telephone No. (703) 308-1113												